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# Part 01

## Quantum Technologies

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In this first part of the book we show why quantum technologies offer new opportunities and bring with them new challenges.

After first introducing our topic in Chapter 1, we explore the world of quantum sensing in Chapter 2. Quantum sensing is an aspect of the quantum science revolution that is already here and promises to be increasingly important in the coming years.

We then have four chapters devoted to computation. We explore the history and a bit of the math of traditional mechanical and electronic computation in Chapter 3, followed by the history of quantum computing in Chapter 4. While the roots of quantum computing go back to the 1960s, the field got its great push forward in the 1990s with the discovery of two quantum algorithms; we discuss these algorithms and their importance, as well as the more likely near-term use of quantum computers for simulating physics and chemistry, in Chapter 5. We end our tour of quantum computing in Chapter 6.

We close this part of the book with a discussion of quantum communications in Chapter 7.

